ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

ahfmr research news

WINTER 2006

From lab to bedside

AHFMR physician-researchers

On the Cover

Peter Mitchell is a Toronto-based artist and a graduate of the Sheridan College illustration program. His work begins with line drawings which are then transferred to glass and layered over collage and acrylic. His clients include the *Globe and Mail*, *Saturday Night* magazine, *EnRoute* magazine, and many others.

AHFMR Mission

AHFMR supports a community of researchers who generate knowledge whose application improves the health and quality of life of Albertans and people throughout the world. AHFMR's long-term commitment is to fund health research based on international standards of excellence and carried out by new and established investigators and researchers in training.

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AHFMR
ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

25 YEARS OF EXCELLENCE

research news

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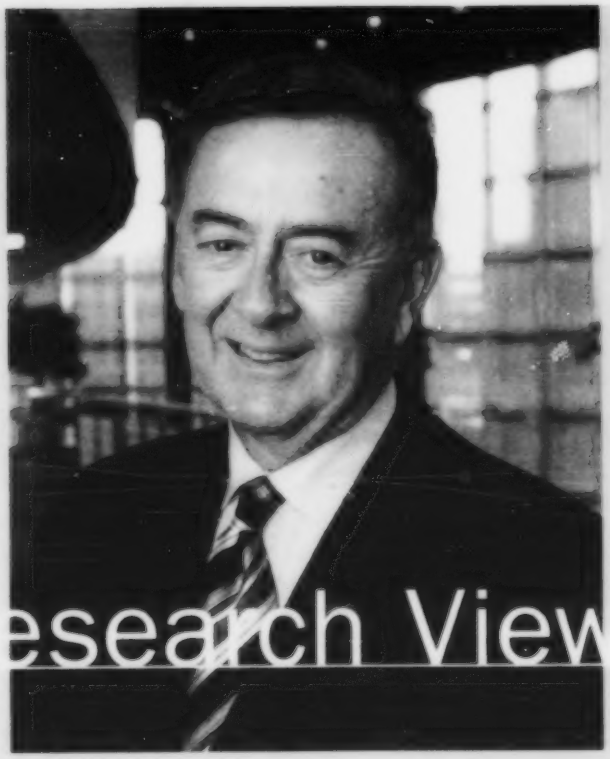


Every day, the news is filled with complex scientific issues: Kyoto and the debate about climate change; mad cow disease; stem-cell research and genetic advances—to name just a few. The public's understanding of these issues often hinges on scientists' ability to explain them clearly. But society's response often hinges on politicians' understanding of the issues. And that is why former official opposition leader Preston Manning is so eager to discuss the importance of communication between scientists and politicians.

Manning points out that, because so many public-policy issues today are science-based, it is important for political people to have an understanding of the science behind them. A great deal of research funding comes from the public purse, and public policy can have an impact on such matters as intellectual property law, so it is also in scientists' interests for politicians to understand their work. "There are mutual interests between these two communities that would be better served if they understood each other."

So, what is the best way to further that mutual understanding? "One of the great advantages medical scientists have is that health care happens to be sky-high in the polls and is the number one political issue," Manning stresses. "The quality of health care is so dependent on the quality of science. Scientists need to prove that what they are doing is relevant politically."

"The quality of health care is so dependent on the quality of science"

The timing of communication can also be very important. Manning emphasizes that significant events can create "waves" that carry or amplify scientists' messages about their research. "During SARS, audiences were highly receptive to learning about epidemiology," he points out. In the same vein, the whole world wanted to know about the geophysics of tsunamis after the earthquake in Southeast Asia in December 2004, and Hurricane Katrina suddenly made the science of hurricanes relevant.

Hurricane Katrina suddenly made the science of hurricanes relevant

What are the "waves" scientists should watch for? Manning has three predictions. "Canada is headed for healthcare reform of some kind, probably a universal system with a mixed approach to payment, delivery of payment, and insurance. This means there will be more capital brought into the system, some of it devoted to research." He also predicts increased interest in, and support for, environmental issues (which have a strong connection to health care), and growing federal-provincial tensions due to high oil prices. Because of these tensions, it will be increasingly important that Alberta's investments be seen to benefit all Canadians, not just Albertans.

In addition to these predictions, Manning also warns scientists and politicians of a special challenge to come. Much has been written about the possibility of an influenza pandemic in the not-so-distant future. In Manning's opinion, the greatest damage will be done not by the pandemic

ABOVE: PRESTON MANNING

itself, but by the transmission of fear and panic through mass communication systems. "It is imperative that communications and understanding between political leaders and scientists be developed at the highest level before this crisis—not in the middle, as happened with SARS," he says. "It is imperative that the health scientists called upon to explain the biological hazard have the ability to clearly inform the public. Not just with cold, hard facts and information, but with calm and courage communicated through demeanour and body language. Whether our communications amplify fears or calm fears will be a critical challenge for scientific and political communicators."

Preston Manning founded the Reform Party in 1987 and was first elected to the House of Commons in 1993. He was the leader of the official opposition from 1997 to 2000 and sat as a member of Parliament until 2002. During his time as an MP he also acted as opposition critic for Science and Technology. Manning is now a senior fellow of the Fraser Institute and of Massey College at the University of Toronto, where he teaches political science courses. He delivered the keynote address, "Research and Politicians: Bridging the Communications Gap", at AHFMR's fall receptions at the University of Alberta and the University of Calgary.

Levelling the playing

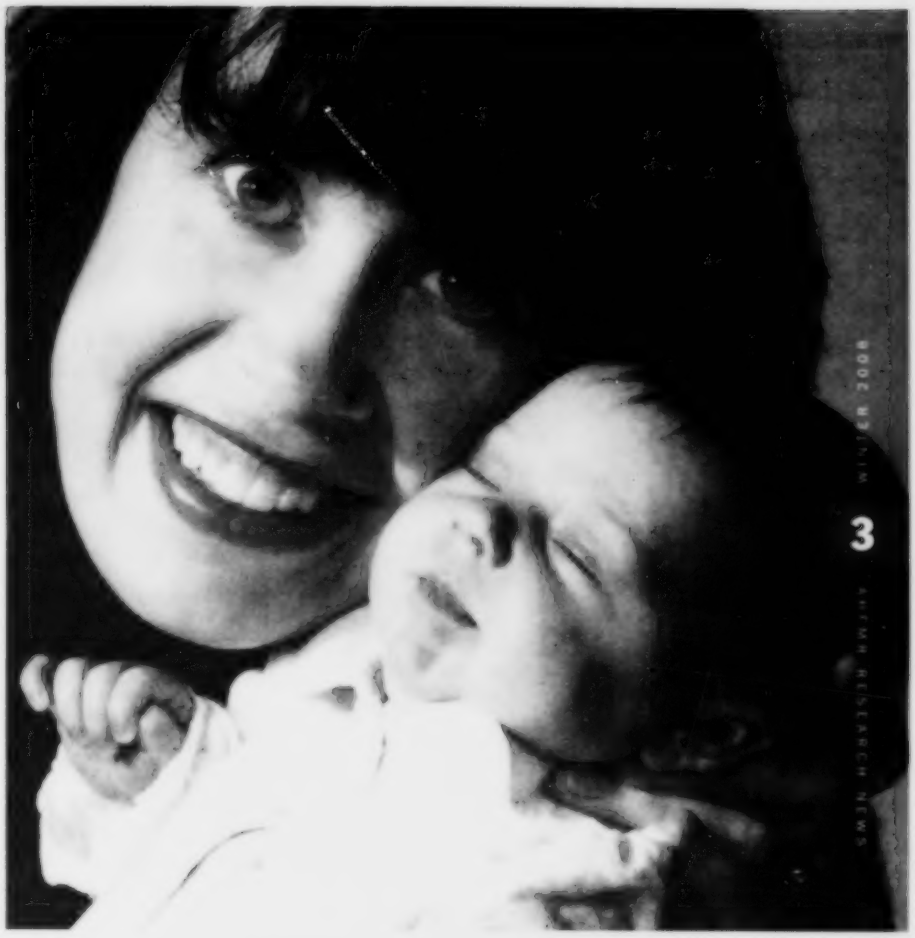
Heritage Scholar Dr. Tara Beattie is a lucky woman. She has two young daughters (a new baby and a two-year-old), a successful career as a research scientist, and a supportive husband. Dr. Beattie also considers herself fortunate because of a new AHFMR program that aims to help female health researchers balance their families and their careers. The new policy is among the first in Canada to recognize the fundamentally different career paths of men and women in research.

All female researchers currently funded by AHFMR who take maternity leave will now automatically qualify for a one-year fully paid extension of their existing Heritage award. This extension will allow them to regain their competitiveness and momentum before they have to reapply for funding, explains Dr. Jacques Magnan, AHFMR vice president of programs.

Men and women become medical researchers in similar numbers. However, while women have almost the same success rates as men for entry-level research funding, they have considerably less success applying for the more senior awards—not only in Alberta but across Canada. It's tougher for female researchers to submit first-class applications for coveted funding when they have taken time off during and after a pregnancy. They must compete against men who haven't taken time off. Also, women with young

PHOTOS: DR. TARA BEATTIE WITH DAUGHTER

field



> *"A lot of women in science have chosen not to have families"*

families often find it difficult to juggle home and research responsibilities. The pressures to publish, and the responsibilities of teaching and managing a lab can take a toll on busy mothers.

"It's very stressful being a woman in science trying to decide when to start a family," says Dr. Beattie. "Several years ago my husband and I decided that no time was ever going to be right so we were just going to do it. The new AHFMR policy is good; they really did it right and it's very fair. It takes a lot of pressure off you. I know of a lot of women in science who have chosen not to have families specifically because of the challenges that are faced. But I wanted a family. It's nice to know that I do have an extra couple of years to be competitive with my male colleagues—at the same level."

> *"With research you can't just leave your job for a year"*

Dr. Beattie took three months off when her first child was born, and checked in with her lab staff frequently. She plans to take six months off with her second baby, again checking in with her lab regularly.

"With research you can't just leave your job for a year, not think about work and then go back and jump into it," she points out. "That's not a realistic expectation. I chose this profession and I knew what I was getting into; but now, with the new policy, you do have a little bit more flexibility. It will allow people who decide to have children to be on a more level playing field. They will be judged on the same level for the same time of productivity."

Dr. Beattie studies the structure and function of an enzyme called telomerase that elongates *telomeres* (the ends of chromosomes, critical for maintaining the stability of the complete set of genes). Dr. Beattie also collaborates with Heritage researcher Dr. Susan Lees-Miller on the relationship between DNA damage and the regulation of telomere length. Research in this field could enhance understanding of how cells age and how cancer develops.

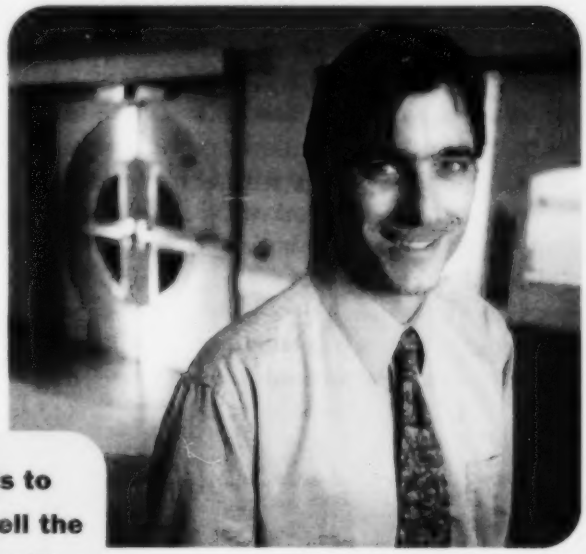
AHFMR Scholar Dr. Tara Beattie is an assistant professor in the Department of Biochemistry and Molecular Biology at the University of Calgary, and a member of the Southern Alberta Cancer Research Institute. She also receives support from the Canadian Institutes of Health Research (CIHR).

Selected publication

Ting NSY, Yu Y, Pohorelic B, Lees-Miller SP, Beattie TL. Human Ku70/80 interacts directly with hTR, the RNA component of human telomerase. *Nucleic Acids Research* 2005 Apr 11;33(7):2090-2098.

AHFMR frequently receives letters requesting information about Heritage research or about various medical conditions. "Responding to the Reader" is an *AHFMR Research News* feature intended to provide up-to-date information related to readers' questions, with the help of experts in the Alberta research community. AHFMR cannot provide medical advice, however; please see your family physician about your specific health concerns.

> A recent Statistics Canada report suggests that nearly half of Canadians aged 16 and over fail to meet basic standards for reading comprehension. A separate 2004 study reports that between 5% and 17% of the population have great difficulty acquiring reading skills—despite adequate intelligence, opportunity, and instruction. So what is going on? A *Research News* subscriber has asked if there are physiological reasons why children might have difficulties learning to read.



Heritage Senior Scholar Dr. Christian Beaulieu's research suggests that it may be a matter of wiring. He uses magnetic resonance imaging (MRI) to look at the connections (the wiring or white matter) between the different parts of the brain. "Everything must be connected so that the flow of information goes in the right order and also goes fast enough," he says. "The idea is to see how well the brain is wired and whether that correlates with how well the person reads."

"The idea is to see how well the brain is wired"

Dr. Beaulieu first studied children aged 9 to 12. MRI scans showed that subjects with better brain connectivity read better than those with poorer connectivity. But this does not answer the "chicken or the egg" question. Dr. Beaulieu explains that since these subjects have had four or five years of reading instruction, it is impossible to know if the kids who did well had a higher connectivity in the first place or if reading had strengthened the connection. He is now looking at younger subjects to help answer this question. Early observations suggest that the white-matter connectivity is an important indicator for reading ability.

The brain, however, keeps developing well into young adulthood; thus to some extent what you do can change how your brain "gets wired", says Dr. Beaulieu. He explains that most of the brain wiring becomes *myelinated* (covered with a sheath that acts as insulation for the "wire") within the first four years of life, and the myelin continues to increase with time. This insulation improves transmission speed. "Scientifically proven training methods can improve reading ability, and the earlier you intervene the better," he adds.

Dr. Beaulieu is quick to point out that, while it would not be practicable to use these MRI studies as diagnostic tests for reading ability, they could be useful in evaluating how the brain responds to training to improve reading, as well as in understanding the underlying causes of reading problems. "Everyone has a range of abilities for everything they do. No matter how much I trained, I couldn't run the 100 metres faster than a world-class sprinter, even with steroids," says Dr. Beaulieu, "but I would still get faster."

Heritage Senior Scholar Dr. Christian Beaulieu is an assistant professor in the Department of Biomedical Engineering at the University of Alberta. He receives support for this project from the Canadian Language and Literacy Research Network (CLLRNet).

ABOVE: DR. CHRISTIAN BEAULIEU

The health of SENIORS

Seniors' health issues deserve the same level of attention, research, and funding as cardiovascular disease or cancer, according to Calgary researcher Dr. Colleen Maxwell. Throughout her career as an epidemiologist and health-services researcher, Dr. Maxwell has worked to improve quality of life and quality of care for the elderly.

"We have an aging population, and quality of life is an important issue," stresses Dr. Maxwell. "With frail elderly patients, there's a huge opportunity to have an impact and to do something worthwhile. We can do something to prevent the decline of older people who are vulnerable. There are opportunities to improve their health outcomes. We can prevent falls, inappropriate medications, and institutionalization. We can avoid the slippery slope that leads to decline and death."

Seniors are very concerned about quality-of-life issues, she points out, but the health system often focuses on higher-profile health challenges and neglects elder-care issues.

According to the findings of a recent survey published in the *Canadian Medical Association Journal*, elderly women felt the health system did an excellent job of addressing such problems as their risks for heart disease, stroke, and cancer. However, they said they would like more help from professionals where other health priorities were concerned—memory problems, for instance, and side effects of medications, vision problems, falls, osteoporosis, and end-of-life issues.

"Aging is not a glamorous, high-profile topic," says Dr. Maxwell. "Seniors' health is interesting, and it's relevant, but relatively few physicians choose to specialize in the care of the elderly. We need to show the elderly that we care what they care about. We need to look at the entire person, not just at how well their individual biological systems are functioning."

The health system often neglects elder-care issues

Currently Dr. Maxwell is leading the first large-scale Canadian study to examine the health characteristics and needs of residents in assisted-living and long-term-care facilities. Assisted-living facilities, she explains, provide care in the community for seniors who are looking for some help with personal care or housekeeping in a home-like setting. These facilities are becoming increasingly popular; but very little information exists on the health needs of their residents, or on the quality of care provided and its outcomes.

Dr. Maxwell and University of Alberta researcher Dr. Laurel Strain are working on this project with colleagues at the universities of Calgary, Alberta, and Lethbridge. An AHFMR grant will provide them with

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RIGHT: DR. LAUREL STRAIN (L) AND DR. COLLEEN MAXWELL

$1 million over three years to examine the effects of recent continuing-care reforms on the health and quality of care of older Canadians in Alberta and British Columbia. The research team is looking at opportunities and strategies for improving quality of life for residents in assisted-living and long-term-care settings. Dr. Maxwell and her colleagues also want to determine priorities for future action to address the most pressing challenges in seniors' health care.

"Aging is not a glamorous, high-profile topic"

"We're trying to bring attention to the fact that we have an increasing number of vulnerable older people in the population at a time when there seems to be less and less attention on either quality care of the aged or maximizing outcomes that are most important to seniors themselves," she explains.

On September 7, 2005, the MLA Task Force on Continuing Care Health Service and Accommodation Standards released "Seniors Report", presenting its recommendations for improving long-term care for Albertans. *www.continuingcare.gov.ab.ca*

Dr. Colleen Maxwell is an AHFMR Population Health Investigator, and an associate professor in the departments of Community Health Sciences and Medicine at the University of Calgary. She is a fellow with the Institute of Health Economics and the Hotchkiss Brain Institute. She also receives funding from the Canadian Institutes of Health Research (CIHR) and through an initiative called Programs in Health Services, administered by AHFMR on behalf of Alberta Health and Wellness.

Selected publications

Maxwell CJ, Hicks MS, Hogan DB, Basran J, Ebly EM. Supplemental use of antioxidant vitamins and subsequent risk of cognitive decline and dementia. *Dementia and Geriatric Cognitive Disorders* 2005 June;20(1):45-51.

Cell signals

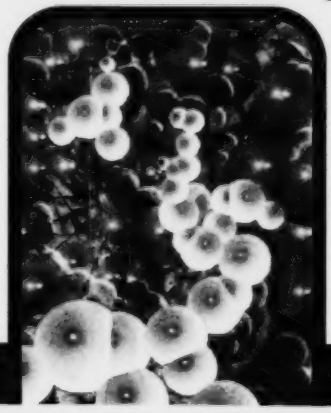
We'd all like to be better at interpreting signals and knowing the best way to react. For cells, responding appropriately to signals can be a matter of life and death. A variety of *signalling* molecules communicate information within and between cells, telling them to grow, divide, move, or die. Through such communication, called *signal transduction*, these messenger molecules can influence processes such as wound healing, tissue inflammation, and blood-vessel formation. Understanding the function and regulation of these molecules provides insight into diseases including cancer and cardiovascular disease.

Heritage Scientist Dr. David Brindley investigates how lipids participate in these signalling processes. While many of us associate lipids with energy storage in the form of fat, lipids can carry out other tasks in the cells, including signalling as lipid messengers. These lipids are *bioactive*, meaning they elicit specific cellular responses.

"There are two ways in which lipids are bioactive," explains Dr. Brindley. "One is that, when outside the cell, they interact with specific receptors on the cell surface and initiate a signalling *cascade* [pathway] that leads to cell division, cell movement, or cell death." And the second? "Lipids are also produced when cells are activated as part of various signalling cascades, which control signalling within the cell."

Dr. Brindley and his research team at the University of Alberta are tackling the nature, regulation, and effects of the signals these lipids generate.

Born in Buxton, England, Dr. Brindley became interested in lipids early in his research career. He earned his Ph.D. at the University of Birmingham under the mentorship of Dr. Georg Hübscher, who had a tremendous influence on him. For his post-doctoral research, Dr. Brindley went on to study lipid synthesis and metabolism in the laboratory of Nobel laureate Dr. Konrad Bloch at Harvard Medical School. He then returned to England,



Dr. Brindley investigates lipids in cell signalling

where he held a position at the University of Nottingham; and, in 1998, he moved to his present position in the Department of Biochemistry at the University of Alberta. Though he is still interested in lipids, the focus of his research has shifted.

"I still work on lipid metabolism, but a lot of the work that I did when I first arrived was based upon the regulation of lipid synthesis. Now it's focused entirely on the function of lipids as signalling molecules in the cell to control signal transduction."

Among the bioactive lipids Dr. Brindley investigates is a group of phosphate-associated lipids. These lipid phosphates are regulated by enzymes known as *lipid phosphate phosphatases* (LPPs). The LPPs break down the original signalling lipid phosphates and convert them to another form. Often, breaking down one form of signalling lipid produces another lipid with its own distinct signal.

"Cells respond to chemical compounds that are formed—in this case the lipid phosphates. We are looking at enzymes that degrade the lipid phosphates and, therefore, attenuate [reduce] signalling by the lipid phosphates. The products of the reaction are also bioactive. So you modify the balance of signalling by two different lipids which are metabolically closely related."

Dr. Brindley's current research has uncovered a role for LPPs in controlling the cell cycle and cell division. In addition, he and his research team have identified an LPP which can inhibit the movement or migration of certain cell types, a process associated with cancer progression. When cancerous cells leave the initial tumour site, in a process called *metastasis*, they can produce additional tumours at other sites in the body.

"We're hoping that this has applications in understanding how to regulate metastatic cancers, because it's the same processes that are operating in cancer," says Dr. Brindley. "If the cell detaches and migrates somewhere else, you get a secondary tumour.

"What I'm really trying to relate my work to now is cancer biology, in terms of the role of the lipids in promoting cell migration and division. We know that one of the enzymes that produce the lipid we're interested in promotes tumour development and metastasis. We're looking now at how the phosphatases might be used to counteract that effect."

The research being done in Dr. Brindley's laboratory has links not only to cancer but also to wound repair, blood vessel formation, inflammation, and cellular response to insulin.

Dr. Brindley collaborates with research groups at the University of Chicago and the University of Tampa. He is also the director of the Signal Transduction Research Group (STRG) at the University of Alberta—a group of ten laboratories with a shared interest in the signalling pathways activated in cells. The STRG group meet regularly to discuss their own research, as well as ideas in the field at large. Dr. Brindley describes the STRG as a great stimulus for interaction and collaboration, and an excellent forum for trainees.

AHFMR Scientist Dr. David Brindley is a full professor in the Department of Biochemistry at the University of Alberta. He also receives funding from the Canadian Institutes of Health Research (CIHR), the Canadian Diabetes Association, the Heart and Stroke Foundation of Canada, and the National Institute of Health (NIH) in the United States. He has received the Fournier Pharma Atherosclerosis Research Communication Award from Fournier Pharmaceuticals, and was Academico Correspondente of the Royal Academy of Pharmacy in Spain.

Selected publications

Zhao Y, Usatyuk PV, Cummings R, Saatian B, He D, Watkins T, Morris A, Spannhake EW, Brindley DN, Natarajan V. Lipid phosphate phosphatase-1 regulates lysophosphatidic acid-induced calcium release, NF-κB activation and interleukin-8 secretion in human bronchial epithelial cells. *Biochemical Journal* 2005 Jan 15;385(part 2):493-502.

Brindley DN. Lipid phosphate phosphatases and related proteins: signaling functions in development, cell division, and cancer. *Journal of Cellular Biochemistry* 2004;92(5):900-912.

ABOVE: DR. DAVID BRINDLEY

From lab to bedside

Heritage Scholar Dr. James Shapiro was planning to be in Edmonton for two years—the length of time that his training in liver transplantation with the University of Alberta's Dr. Norm Kneteman was expected to take. Then it would be back home to England....That was 12 years ago.

AS IT TURNED OUT, Alberta was not only a good place to learn advanced surgical techniques; it was fertile ground for research in *islet transplantation.* Islets are the cells in the pancreas that produce insulin—a hormone that helps the body use sugar for energy. In type 1 diabetes, which is an autoimmune disease, the immune system destroys islets. Transplantation replaces the destroyed islets with healthy ones from donor pancreases.

Dr. Shapiro had done research on islet transplantation while he was at medical school in the early 1980s. "The U of A had established an islet transplantation group which was well known. I saw that, as well as doing surgical training here, I could also pick up the threads of my research."

And pick them up he did. Dr. Shapiro decided to do a Ph.D. in addition to his surgical fellowship. His research focused on improving the anti-rejection drugs that all transplant patients must take. At that time, one of the main reasons for the failure of islet transplantation was that

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LEFT: DR. JAMES SHAPIRO

Physician-researchers bring unique perspectives to both lab and clinic

Dr. Sita Gourishankar

Dr. Sita Gourishankar is a nephrologist and a kidney-transplant researcher at the University of Alberta. She notes that, while the short-term outcomes for kidney transplants have improved considerably, "in the longer term we still have transplants that fail over time, resulting in patients returning to dialysis or dying. That's why research in this area is so vital."

Dr. Gourishankar probes the mysteries of kidney-transplant failure. This is an exciting time for transplant research, because scientists have made advances in detailing genetic information about the inflammatory processes behind rejection. The answers may lead not only to new ways of preventing transplant rejection and failure, but also to new treatments for kidney disease and other diseases that involve the immune system.

DR. SITA GOURISHANKAR

Dr. Sita Gourishankar, an AHFMR Clinical Investigator, is an assistant professor in the Division of Nephrology and Transplantation Immunology, part of the Department of Medicine at the University of Alberta. Her research is also supported by the National Institutes of Health (NIH) in the United States, the Canadian Institutes of Health Research (CIHR), the University Hospital Foundation, Astellas Canada Inc., and Amgen Canada Inc.

the drugs commonly given to transplant patients—steroids and cyclosporin—were toxic to islet cells.

At the same time, Dr. Shapiro accepted a permanent position in Edmonton. He took additional training in living-donor liver transplantation in Japan and whole-pancreas transplantation in Baltimore. "There were some lonely days and nights in Baltimore waiting for donated organs. I spent that time formulating a more islet-friendly anti-rejection recipe."

This combination of steroid-free anti-rejection drugs coupled with a sufficient mass of islets to allow a measure of insulin independence is now known worldwide as the Edmonton Protocol. It is the most successful and most widely replicated method of islet transplantation in the world.

Since they published the first paper on the Edmonton Protocol in the *New England Journal of Medicine* in 2000, Dr. Shapiro and his team have taken islet transplantation from an experimental procedure to a clinical one. Forty centres in 34 countries now do islet transplantation. Globally, more than 550 people have received islet transplants.

"Physicians bring a clinical focus to research"

"Down the road I think the Edmonton Protocol will be regarded as a major stepping stone toward a cure for diabetes," says Dr. Shapiro. "It is not a cure because it falls short. But if we could find even more friendly anti-rejection drugs and ways to ensure the survival of more islets, we'd be closer to a cure. And that's where we're focusing most of our research. Thirty years from now, I'm confident we'll have a better source of islets, and treatments that have few, if any, side effects. We may even reach a point where patients don't need anti-rejection drugs.

"I feel extremely fortunate to have had the opportunities I've had in Alberta. The support from the Heritage Foundation is unique, and it's why I chose to stay here."

AHFMR supports a growing number of researchers who, like Dr. Shapiro, are also practising physicians. The Foundation expects physician-researchers to commit not less than 75% of their time to health-research activities.

"Physicians bring a clinical focus to research; we're always asking how the knowledge that comes from basic research will help our patients," notes Dr. Shapiro. "As a result, there are strong collaborations between physician-researchers and basic researchers. We gain from each other."

Cancer

Like Dr. Shapiro, Heritage Clinical Investigator Dr. Tony Reiman planned to be in Edmonton for only two years. He came to the University of Alberta in 1999 for oncology training after doing his residency in internal medicine at Dalhousie

ABOVE: DR. TONY REIMAN

"I want to be part of the process that makes things better"

University in Halifax. Dr. Reiman and his wife found that they enjoyed Edmonton and decided to stay.

As a medical oncologist at the Cross Cancer Institute, Dr. Reiman specializes in treating patients with multiple myeloma, lymphoma, and lung cancer. These are all deadly cancers, and the diagnosis for many of his patients is often discouraging. "I strive to give my patients the best treatments there are," says Dr. Reiman, "but the reality is that, for some cancers, even the best treatments available are not good enough. I can't imagine devoting my life to treating patients without trying to improve things. I want to be part of the process that makes things better."

This commitment drives Dr. Reiman's research. His particular interest is *multiple myeloma*, an incurable cancer of the plasma cells. These cells–important parts of the immune system–normally make up a very small portion of the cells in the bone marrow, where they are made. However, myeloma plasma cells grow unchecked, invading the hard outer part of the bone and forming multiple small lesions throughout the body. The disease damages the immune system and is also characterized by osteoporosis in the pelvis, spine, ribs, and skull. The average life expectancy for someone with multiple myeloma is three to four years after diagnosis.

In Canada, there are about 1,850 new cases of multiple myeloma annually. The Cross Cancer Institute sees 50 to 70 new multiple myeloma patients every year.

"Patients are crucial to my research," explains Dr. Reiman. "Most of them agree to participate in trials where we take extra blood or extra bone-marrow samples, and carefully review their history. The goal is to look at proteins and see if we can distinguish one that is specific to the disease, which could make it a good therapeutic target. If we could knock it out, that might stop the cancer without affecting the patient's general health."

One promising target is a protein called RHAMM (receptor for hyaluronan-mediated motility). Elevated levels of RHAMM appear to correlate with aggressive disease. A team from the Cross Cancer Institute–including Dr. Reiman, Dr. Linda Pilarski,

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Dr. Brenda Hemmelgarn

Dr. Brenda Hemmelgarn wants to find a better way to identify people who have chronic kidney disease, and get them the specialized care and treatment they need early in the course of their illness. She uses computerized laboratory data as a resource for identification and surveillance of kidney disease, and as a tool to guide patient care.

Her research addresses the question of why certain groups of people, including Aboriginal people and the elderly, have a higher-than-normal incidence of chronic kidney disease. She examines differences between groups of people: differences that might affect their access to treatment and care for this disease. Dr. Hemmelgarn is currently leading a study to determine the prevalence and progression of kidney disease among elderly people in the Calgary Health Region. She is extending that surveillance system to include all of Alberta.

Dr. Brenda Hemmelgarn is an AHFMR Population Health Investigator and a CIHR New Investigator; she is an assistant professor in the departments of Medicine and Community Health Sciences at the University of Calgary.

DR. BRENDA HEMMELGARN AND PATIENT

and Dr. Andrew Belch—investigates the relationship between RHAMM and abnormalities in the centrosome, a specialized region of cells that plays a key role in cell division. RHAMM may affect the structure of the centrosome, causing genetic instability.

"RHAMM is a starting point for me to figure out what drives the biology of multiple myeloma, what distinguishes it from normal tissue," says Dr. Reiman. "In the end, it may be a protein other than RHAMM that is the key. My goal is to frame the research so that we can use the knowledge we gain in a way that helps patients."

Dr. Evangelos Michelakis

DR. EVANGELOS MICHELAKIS

Dr. Evangelos Michelakis is a cardiologist who has expertise in both basic science and clinical research. He runs a state-of-the-art molecular physiology laboratory and a multidisciplinary pulmonary hypertension clinic, where many treatments—both approved and experimental—are used. Dr Michelakis is a leader in the development of experimental therapies for pulmonary arterial hypertension (PAH), a severe and debilitating disease that constricts and thickens the blood vessels of the lungs. The disease typically affects women in their 30s and can be inherited. Treatment options are limited and expensive; PAH eventually causes heart failure and death.

Dr. Michelakis leads a large multidisciplinary study of PAH. By offering patients with PAH a single-point-of-entry referral process, rather than sending them to a number of different services, he hopes to shorten hospital stays or avoid hospitalization altogether; decrease emergency room visits; and make the best use of the very expensive treatments for PAH.

Dr. Evangelos Michelakis is an AHFMR Scholar and a Canada Research Chair in Pulmonary Hypertension. He is an associate professor in the Division of Cardiology at the University of Alberta.

Assessing liver disease

Heritage Clinical Investigator Dr. Rob Myers says it's a good time to be a *hepatologist* (a specialist who treats liver diseases). "Previously, many liver diseases were considered untreatable. Now the situation for patients has changed dramatically. There are effective treatments for some diseases, and we can see many new treatments on the horizon. For example, 15 years ago there were no effective treatments for *hepatitis C*, a liver disease that affects nearly 1% of Albertans. Now we can cure close to 60% of patients. That is a huge advance. Similar strides are being made with hepatitis B, although the progress has been a bit slower."

Dr. Myers joined the University of Calgary in January 2003, after completing an AHFMR-funded research fellowship in hepatology at the University of Paris with Dr. Thierry Poynard, an international authority on viral hepatitis. The Calgary position was a chance for Dr. Myers not only to treat patients, but also to continue his research on liver disease.

His research focuses on the 40% of hepatitis C patients for whom current treatments are not effective. The hepatitis C virus, which is spread primarily through contact with blood and blood products, is one of the most important causes of chronic liver disease. Chronic hepatitis C can cause cirrhosis, liver failure, and liver cancer. It's estimated that at least 20% of patients with chronic hepatitis C develop cirrhosis, which results from progressive scarring (fibrosis) over many years. Liver failure from chronic hepatitis C is the most common reason for liver transplantation.

"Previously, many liver diseases were considered untreatable"

"For hepatitis C, the patients who get cirrhosis are the ones who have the serious complications: liver failure, liver transplantation, or hepatocellular cancer," explains Dr. Myers. "The idea is to prevent the scarring that ultimately leads to cirrhosis. In this way, we'll prevent these complications."

One of the key steps in understanding fibrosis is assessing the degree of scarring in the liver. The only way to do this currently is by biopsy–taking a tiny piece of liver tissue. This procedure, however, has many limitations. It is expensive and invasive, and the chance of bleeding is 1 in 1,000. About 1 in 5 patients has pain following the procedure and must take at least one day off work. In addition, the scarring may be patchy, and because a biopsy takes only one 50,000th of the liver, it might not truly indicate the amount of scarring. A less invasive test that could be repeated frequently would help in the follow-up of patients and in the assessment of new anti-fibrotic therapies. Patients could be assessed numerous times to measure the effectiveness of the therapy.

"So the idea is to develop a combination of blood tests that would indicate the degree of fibrosis in the entire liver, rather than a fragment of it," says Dr. Myers. He has just begun recruiting patients for this study. He plans to consider a number of markers in the blood, in order to come up with the best combination of markers for assessing liver scarring accurately.

"There's no doubt that these blood tests will be expensive at first, but they won't cost as much as a biopsy; and the price will fall. And their other advantages are compelling–no complications, and no indirect costs due to lost productivity. It makes sense to pursue this goal."

Understanding asthma

When Heritage Clinical Investigator Dr. Richard Leigh's patients describe their asthma symptoms, he really knows what they're talking about. An asthmatic himself, Dr. Leigh is a specialist in respiratory medicine who treats patients with asthma and chronic obstructive pulmonary disease (COPD), and who also does research on these conditions.

LEFT: DR. ROB MYERS

Dr. Kevin Hildebrand

Dr. Kevin Hildebrand is an orthopedic surgeon who specializes in treating elbow and wrist disorders. His research focuses on a key challenge faced by people recovering from a traumatic elbow injury—regaining the full range of motion. Unfortunately, most people do not achieve this because they suffer from some degree of elbow-joint contracture. With limited elbow motion, such simple tasks as brushing teeth and reaching for objects are difficult. The condition can also lead to chronic forms of arthritis.

DR. KEVIN HILDEBRAND

Dr. Hildebrand studies tissue from the elbow-joint capsule to discover why the capsule changes during injury. He hopes to use this information to develop new treatments or preventive measures for loss of joint motion following injury—work that could have significant impact on treatment of arthritis, strokes, and spinal-cord injuries.

Heritage Clinical Investigator Dr. Kevin Hildebrand is an associate professor in the Department of Surgery at the University of Calgary. In addition to his AHFMR support, he also receives funding from the Health Research Foundation, CIHR, and the Calgary Health Region.

His particular interest is the nature of the *chronic airway inflammation* that is a hallmark of asthma. This inflammation causes structural changes in the airway walls–a process called "airway remodelling" which is thought to play an important role in the persistence of airway hyper-responsiveness. This is the exaggerated response by which the airways constrict too much and too quickly in response to inhalation of airborne allergens, such as cat dander or house dust, or non-specific irritants such as tobacco smoke.

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Dr. Po-Yin Cheung

Dr. Po-Yin Cheung is a neonatologist who does clinical and basic-science research on the resuscitation of babies who were deprived of oxygen at birth or as newborns. Results from international research recently led to a change in the guideline regarding the use of supplemental oxygen in resuscitating oxygen-deprived newborns. Dr. Cheung studies the concentration of oxygen used in neonatal resuscitation, as well as certain medications that are given to support heart function in these babies.

"In the neonatal intensive care unit (NICU), we see complications after the initial sickness, and we don't know if they were caused by the disease or the medicine. We need to know exactly how these drugs affect infant physiology. I hope to be able to say which medications are better, and how they should be used to give the best care to the babies we see in the NICU."

Dr. Po-Yin Cheung is an AHFMR Clinical Investigator and an associate professor in the Department of Pediatrics and Child Health and the Department of Pharmacology at the University of Alberta. His research is also supported by CIHR, the Heart and Stroke Foundation of Canada, the Stollery Children's Hospital Foundation, the University Hospital Foundation, and the Royal Alexandra Hospital Foundation.

DR. PO-YIN CHEUNG

"That's the beauty of translational research"

Dr. Leigh explains: "For example, right now I'm unlikely to have overt airway inflammation. But if I were to go running outdoors on a very cold day, I would start to experience chest tightness and wheezing. The question is: Why am I getting chest tightness and wheezing if I don't have inflammation? It's probably because of the underlying structural changes in my airways.

"We've been treating inflammation in asthma for 25 years. We have appropriate medications—inhaled corticosteroids—that are very effective in treating airway inflammation. Yet people continue to experience ongoing asthma symptoms; and, sadly, some still die from the condition. The next big breakthrough in asthma treatment will likely come from a paradigm shift where we start to treat airway remodelling. My research is aimed at understanding how we might do that."

Dr. Leigh studies the possible mechanisms behind airway inflammation and remodelling. These include the response of cells to mechanical strain and the effects of viral infections in the development of airway remodelling. Work done in the United States shows that about 50% of young children who have viral bronchiolitis (sometimes called wheezy bronchitis) go on to develop asthma later. "We know that airway remodelling happens very early on in asthmatics, by the time they are five or six years old," notes Dr. Leigh, "but it's not understood how childhood virus infections contribute to airway remodelling."

Part of his research involves a new sputum test that shows whether a patient's lungs are producing the inflammatory cells that cause asthma. It was developed at McMaster University, where Dr. Leigh did his Ph.D. This simple, non-invasive test makes it much easier to diagnose and assess asthma in the

ABOVE: DR. RICHARD LEIGH

clinic. It is also a valuable research tool for measuring airway inflammation and an excellent alternative to current tests that are both time-consuming and invasive.

Much of Dr. Leigh's research is done in collaboration with other members of the University of Calgary's Airway Inflammation Research Group, including Dr. David Proud and Heritage researchers Dr. Rob Newton and Dr. Mark Giembycz. "Collaborating with outstanding basic scientists provides a strong synergy for the type of translational research I do. It allows us to understand the molecular and cellular mechanisms of airway remodelling and apply it to patients. That's the beauty of translational research."

Heart-rhythm research

Heritage Scientist Dr. Anne Gillis came to the University of Calgary in 1986, attracted by the offer of an AHFMR Clinical Investigator award. The heart-rhythm specialist was eager to find a position that would allow her to treat patients *and* pursue a research career. "I had serious offers from other provinces," says Dr. Gillis, who was born and raised in Nova Scotia, "but AHFMR's guarantee of protected time for research played a key role in my decision to come to Alberta.

"In many other places, physician-scientists have to do a lot of clinical work to generate their salary. If I hadn't had the protected time for research, I would not have become a successful scientist."

Successful is a good description for Dr. Gillis. In 2003 she became a Heritage Scientist, the highest award given by AHFMR. She is the first physician-scientist recruited to Alberta as a Clinical Investigator to attain this prestigious level of funding.

Dr. Gillis' research focuses on *heart-rhythm abnormalities:* ventricular arrhythmia,which is the leading cause of sudden cardiac death; and atrial fibrillation, the most common heart-rhythm disorder. In her basic-science lab, she uses animal models to study the factors that lead to the development of these abnormalities, as well as to test the effectiveness of new therapies. One of her newest projects, for example, investigates the potential of *statins*—a class of drugs used to lower cholesterol—to prevent atrial fibrillation.

Dr. Gillis also has a major interest in the technology of pacemakers and other implantable cardiac devices (ICDs). She is often asked to give advice on the development of new ICD technologies and to participate in their evaluation. Her leadership role is the reason why Calgary's Arrhythmia Program is the first centre in Canada to evaluate a new telehealth technology for patients with implantable defibrillators. In a pilot project, patients were given monitors that allowed them to download the information stored in

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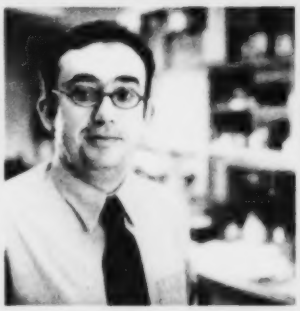
Dr. Harissios Vliagoftis



DR. HARISSIOS VLIAGOFTIS

Dr. Harissios Vliagoftis combines his love of patient care with a passion for research. A specialist in internal medicine, allergy, and immunology, he spends part of his time caring for patients with asthma and other allergic diseases at the University Hospital in Edmonton. The rest of the week, he is busy in his lab investigating how inflammation in the airways affects the development of asthma and triggers its symptoms.

Dr. Vliagoftis focuses his research on the mechanisms of allergic sensitization and the development of allergic airway inflammation, which is one of the characteristics of asthma. In particular, he is interested in the role of serine proteases (a family of enzymes) and one of their receptors known as (PAR-2). Serine proteases are released in the airways from inflammatory cells, or are inhaled as components of airborne-allergen particles. Dr. Vliagoftis aims to reduce the severity of the disease by interfering with the effects of proteases on their receptors.

Dr. Harissios Vliagoftis is an AHFMR Clinical Investigator and an assistant professor in the Division of Pulmonary Medicine at the University of Alberta. He also receives funding from CIHR and the Alberta Lung Association.

their defibrillators and transmit it via phone lines to a secure website.

"About 30% of our patients have to travel more than 100 kilometres to get to our clinic," notes Dr. Gillis. "Many of them are elderly and must have a family member take time off work to travel with them. This new technology could save many trips for routine visits. We may also be able to use it on an urgent basis. If a patient's defibrillator detects an arrhythmia and gives them a shock, they can send us the data and we can determine whether or not the patient has to come to the clinic. It may just be that their medication needs to be adjusted—something that can be done over the phone." Dr. Gillis hopes that in the long term this technology will become the standard of care.

"Innovations like these wouldn't happen without a strong research side to our healthcare system," says Dr. Gillis. "Heritage-sponsored physician-scientists bring new therapies and diagnostics to their patients. And it's not just the innovations from their own labs; they bring innovations from around the world into our system.

"Without the leadership of physician-scientists, I don't think we'd have the state-of-the-art healthcare delivery models that we have in Alberta today."

ABOVE: DR. ANNE GILLIS

"Physician-scientists bring new therapies to their patients"

Dr. Derek Exner

Calgary cardiologist Dr. Derek Exner has a special interest in the risk factors associated with serious heart-rhythm problems, and devices used to treat heart disease. He is involved in several cardiovascular trials to investigate why heart-attack patients are more likely than most people to die suddenly, and to find methods of improving device therapy in patients with heart failure.

Dr. Exner's AHFMR-funded research assesses how a heart attack affects the electrical system within the heart and the autonomic nervous system that controls the heart, as well as the impact of psychological depression on the autonomic nervous system. He hopes that one day the results of his research will help identify people at risk before they start to develop problems, so that measures can be taken to lower their risk and prevent their deaths.

AHFMR Clinical Investigator Dr. Derek Exner is an associate professor in the departments of Medicine and Community Health Science and the Libin Cardiovascular Institute of Alberta at the University of Calgary. He also receives funding from the Heart and Stroke Foundation of Canada and CIHR.

DR. DEREK EXNER

Dr. James Shapiro is the director of the Clinical Islet Transplant Program and an assistant professor in the Department of Surgery at the University of Alberta. An AHFMR Scholar and holder of the CIHR-Wyeth-Ayerst Clinical Research Professorial Chair in Transplantation, he also receives funding from the Juvenile Diabetes Research Foundation, and the National Institutes of Health (NIH) in the United States.

Dr. Tony Reiman is a medical oncologist at the Cross Cancer Institute and an assistant professor in the Department of Oncology at the University of Alberta. An AHFMR Clinical Investigator, he is also supported by CIHR (Canadian Institutes of Health Research), the National Cancer Institute of Canada, the Lance Armstrong Foundation, and the Alberta Cancer Board.

Dr. Robert Myers, an AHFMR Clinical Investigator, is the director of Calgary's Viral Hepatitis Clinic and an assistant professor in the Department of Medicine at the University of Calgary.

Dr. Richard Leigh, an AHFMR Clinical Investigator and a CIHR Clinician Scientist, is an assistant professor in the Department of Medicine and the Department of Physiology and Biophysics at the University of Calgary. He also receives funding from the Alberta Lung Association.

Dr. Anne Gillis is a full professor in the Department of Medicine at the University of Calgary. An AHFMR Scientist, she is also supported by CIHR, Alberta Health and Wellness, the Calgary Health Trust, and the Heart and Stroke Foundation of Alberta.

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DR. RODGER LOUTZENHISER BELIEVES THAT KNOWING HOW THE SMALLEST BLOOD VESSELS IN THE BODY FUNCTION COULD HOLD A KEY TO NEW TREATMENTS FOR SOME OF TODAY'S MOST PREVALENT MEDICAL CONDITIONS.

THE KIDNEY'S TINY BLOOD VESSELS

ABOVE: DR. RODGER LOUTZENHISER

A Heritage Scientist and member of the University of Calgary Smooth Muscle Research Group, Dr. Loutzenhiser studies the intricate workings of tiny blood vessels in the kidney—an organ that has fascinated him for more than 30 years.

"If you think about it, an organism is exposed to a myriad of environmental toxins," explains Dr. Loutzenhiser. "An interesting problem is how do you get a system that will remove every potential toxin from the blood? It would not be possible to evolve a transporter for each toxic agent."

Kidneys solve this problem by first making a protein-free filtered liquid of the blood, filtering out all the protein and toxins from the blood, and then selectively reabsorbing the essential nutrients and electrolytes. The toxins are trapped and excreted in urine. The magnitude of this process is remarkable, says Dr. Loutzenhiser: In 24 hours, the kidneys normally filter and reabsorb 180 litres, the capacity of a large bathtub. This is the equivalent of reprocessing the entire volume of plasma blood in the body about 60 times per day.

Dr. Loutzenhiser's research focuses on the blood vessels that control the filtration process, addressing the mechanisms that regulate the size of two small blood vessels called arterioles, and the mechanisms that enable the entry vessel to respond to pressure. "Each kidney has approximately one million *glomeruli:* these are the sites at which the blood is filtered. Within each glomerulus is a small tuft of capillaries. Blood enters through a tiny vessel called the *afferent arteriole* and leaves through the *efferent arteriole.* These two vessels thus regulate the inflow and outflow resistance of the intervening glomerular capillaries, thereby controlling the filtration pressure."

In conditions associated with reduced kidney circulation, such as congestive heart failure, the efferent (exit) arteriole constricts while the afferent (entry) arteriole remains dilated. This increases outflow resistance, maintaining glomerular capillary pressure in the face of reduced blood pressure. Drugs that interfere with this process, like non-steroidal anti-inflammatory (NSAID) agents such as Aspirin, can lead to a reduction in glomerular filtration, and thus to kidney failure in such patients. By contrast, when blood pressure is

{ EACH OF THESE BLOOD VESSELS IS ONLY ABOUT ONE-TENTH THE SIZE OF A HUMAN EYELASH

elevated, constriction of the afferent arteriole not only prevents filtration from increasing but, more importantly, protects the glomerulus from injury.

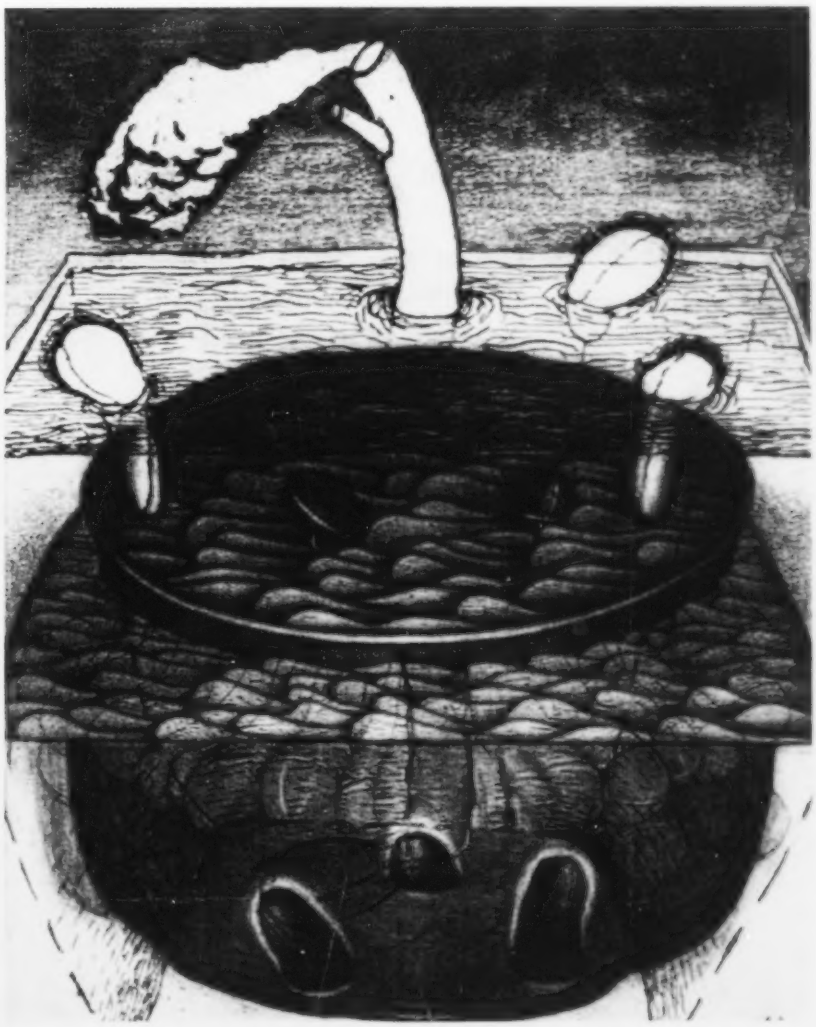
Since each of these little blood vessels is only 10 to 20 microns in size—about one-tenth the size of a human eyelash—they must be studied using a video microscope and high-speed video imaging. This painstaking work has allowed Dr. Loutzenhiser and his team to view the workings of the kidney at a cellular level and carry out research that is changing our understanding of kidney microcirculation.

One area that could ultimately benefit from this research is hypertension. "High blood pressure is very closely linked with renal failure," says Dr. Loutzenhiser. "The glomerular capillaries normally operate at a relatively high pressure; but when the pressure is too high, this causes glomerular injury." If not prevented, the injury progresses, ultimately resulting in chronic kidney failure and a need for dialysis or transplantation.

"HIGH BLOOD PRESSURE IS CLOSELY LINKED WITH RENAL FAILURE"

"What happens in certain disease states, like diabetes, or in susceptible individuals is that the mechanisms normally protecting the kidney from elevated blood pressure seem to fail," he says.

Dr. Loutzenhiser and his team continue to develop methods to study kidney microcirculation at the cellular level. By investigating the nature and function of the afferent and efferent vessels, they hope to better understand the mechanisms that normally protect the kidney from hypertension and to learn how these mechanisms fail in certain diseases. For example, the afferent arteriole has a natural ability to narrow in response to elevated pressure. This is called a *myogenic response*. When pressure within a blood vessel increases, the smooth muscles of the vessels contract; if the pressure decreases, the vessels dilate. A unique feature of the afferent arteriole is its ability to respond to a pulsating pressure, such as the blood pressure signal. "This type of myogenic response is not seen in other vessels, and we believe it plays a critical role in protecting the kidney in settings such as hypertension," explains Dr. Loutzenhiser.



ARTWORK: SEAN CAULFIELD. *RESERVOIR*, 2000. ETCHING, MEZZOTINT, CHINE COLLÉ ON PAPER. 76 X 35 CM (29 15/16 X 13 3/4 IN.). COURTESY OF THE ALBERTA FOUNDATION FOR THE ARTS.

Dr. Rodger Loutzenhiser is a full professor in the Department of Pharmacology and Therapeutics at the University of Calgary.
He is an AHFMR Scientist whose research has been supported by operating grants from the Canadian Institutes of Health Research (CIHR), the US National Institutes of Health (NIH), the Heart and Stroke Foundation of Alberta, and the Kidney Foundation of Canada.

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Prion research

Heritage Clinical Fellow Dr. Valerie Sim is fascinated by abnormal prion proteins and the diseases they cause. For just over a year the Calgary-raised physician has been doing post-doctoral research in prion disease with a team of world-renowned researchers at the National Institute of Allergy and Infectious Diseases laboratories in Hamilton, Montana. The team investigates the role of prion proteins in causing diseases such as mad cow disease in cows, scrapie in sheep, chronic wasting disease in deer and elk, and Creutzfeldt-Jakob disease in humans.

DR. VALERIE SIM

Dr. Sim and her collaborators at Rocky Mountain Laboratories have shown that size matters when it comes to prions. Abnormal prion proteins will clump together and ultimately form long strands. But the smaller clumps are actually more infectious than the long strands. Individual, unclumped prion proteins are not infectious.

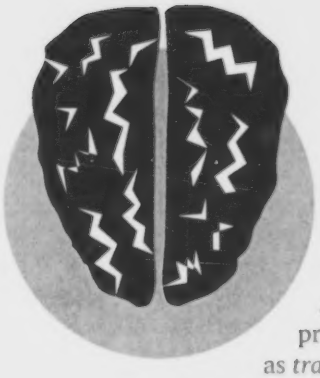
Size matters when it comes to prions

The research team successfully separated the prion protein particles. It was no easy task. "This particular protein is incredibly difficult to work with because the abnormal form sticks to itself, and the normal form sticks to everything else," says Dr. Sim.

"It's quite a challenge to get good structural data. That's why we still have so many unanswered questions about the function of the normal prion protein, and how the abnormal form causes infection and disease. It's just hard to study."

The Montana team investigates what happens when prions become folded the wrong way, a phenomenon which is associated with many different diseases. "Once the prion protein is misfolded it's like a rock: it's very hard to damage it or unfold it."

According to Dr. Sim, if people are exposed to enough malformed prion protein (in contaminated meat, for example) they can become infected with prion disease. Once the prion protein has become abnormally folded, it will infect adjacent normal cells, causing normally-folded prion proteins to fold abnormally as well. Each abnormal prion protein affects the prion protein it comes into contact with, and then that abnormal protein transforms the next normal protein, and so on. This



cascade process causes irreversible damage to cells, particularly neurons in the brain. The cells begin to die. A brain infected with prion disease—also known as *transmissible spongiform encephalopathies* (TSE)—looks rather like a sponge: full of holes.

Abnormal protein deposits are found in the brain in many neurodegenerative conditions, such as Alzheimer's and Parkinson's diseases; however, many questions remain concerning what types and sizes of protein deposits are the prime causes of disease. "While prion disease may be relatively rare, what we can learn about how these proteins fold and misfold and cause disease will have tremendous overlap with a lot of the more common neurodegenerative diseases," says Dr. Sim.

Dr. Valerie Sim is an AHFMR Clinical Fellow who also receives support from the National Institutes of Health (NIH) in the United States. She conducts post-doctoral research at the National Institute of Allergy and Infectious Diseases' Rocky Mountain Laboratories in Hamilton, Montana, and hopes to return to Calgary to work as a clinician-scientist.

Selected publication

Silveira JR, Raymond GJ, Hughson AG, Race RE, Sim VL, Hayes SF, Caughey B. The most infectious prion protein particles [letter]. *Nature* 2005 Sep 8;437(7056):257-261.

Thank you

Thank you *Research News* readers for your overwhelming response to our readership survey! Prize winners will be announced in the next issue.

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Canadian Association for the Study of the Liver
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University of Calgary Smooth Muscle Research Group
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Canadian Food Inspection Agency
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The European and Allied Countries Collaborative Study Group of CJD (EUROCJD)
http://www.eurocjd.ed.ac.uk/index.html

National Prion Disease Pathology Surveillance Center
http://www.cjdsurveillance.com/

Inaugural Inukshuk Conference

During 2005, AHFMR celebrated its 25th anniversary with a number of special programs and events throughout the year. One such initiative was the establishment of a regular conference to focus on an area of health of particular interest to Albertans—one in which Alberta has already established a nucleus of research excellence. The first Inukshuk Conference, held in Banff in November 2005, focused on "Fetal and Early Childhood Development for Optimal Health". The event attracted health researchers, social scientists, and policy-makers from around the world, to discuss a wide range of factors contributing to early health and development.

Conference participants, including a number of Alberta-based researchers, heard presentations on fetal origins of disease; social and economic determinants of health; the health and social well-being of Australia's aboriginal children; physical aggression during early childhood; and economic arguments for investing in children. The interdisciplinary nature of the conference created an exceptional opportunity for participants to build contacts outside their own areas of focus, and to develop a more comprehensive understanding of early-childhood health. A summary paper will be available in early 2006. AHFMR is now considering potential themes and possible dates for future Inukshuk conferences.

ABOVE: HONOURABLE PETER LOUGHEED AND PREMIER RALPH KLEIN

AHFMR announces two major new awards honouring Lougheed and Klein

As part of its 25th-anniversary celebrations, AHFMR announced two major annual awards for health research. The awards honour former Alberta premier, Peter Lougheed, and current premier, Ralph Klein, for their key contributions to the Foundation. Mr. Lougheed's government created the Alberta Heritage Foundation for Medical Research in 1980 with a $300-million endowment from the Alberta Heritage Savings Trust Fund. In January of this year, Premier Klein announced his government's decision to commit an additional $500 million over the next three years.

Each year the AHFMR Lougheed Prize will award $100,000 to an outstanding researcher in the area of basic biomedical or clinical research. The AHFMR Klein Prize will award $100,000 to an outstanding researcher in the area of population and/or applied health. The first Lougheed Prize will be awarded in the fall of 2006 and the first Klein Prize in the fall of 2007. Both prizes will be open to international competition.

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